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FARM CREDIT ADMINISTRATION  
UNITED STATES DEPARTMENT OF AGRICULTURE  
WASHINGTON, D. C.

SOME EFFECTS OF  
MARKETING EGGS IN OHIO  
ACCORDING TO OFFICIAL GRADES

By  
HARRY E. RATCLIFFE

A study conducted with funds provided  
by the Research and Marketing Act

COOPERATIVE RESEARCH AND SERVICE DIVISION

UNITED STATES DEPARTMENT OF AGRICULTURE  
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WASHINGTON 25, D. C.  
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## SUMMARY

For many years officials of State colleges of agriculture, State departments of agriculture, producer organizations, the United States Department of Agriculture, and others have advocated marketing eggs on a graded basis. Ohio is one of the leading States in the use of Federal-State egg grades.

The principal purpose of this study was to determine the effects on production and marketing of paying producers for eggs according to quality as measured by official grades.

The Federal-State Egg Grading and Inspection Service is a cooperative arrangement between the United States Department of Agriculture and a State or other agency requesting the service for the primary purpose of furnishing producers, processors, and others an impartial egg-grading service based on official United States standards and grades.

The official grading service was set up in Ohio in 1932. Organizations using the service are located in all parts of the State. In 1950, 26 organizations used the service. During the period since the service was begun, 72 organizations participated at one time or another. Nine organizations have used the service for 11 years or more. Six of these 9 are producer-owned and started using the service at the time they were organized.

The volume of eggs graded by the Ohio Federal-State egg-grading service increased from 14,000 cases in 1932 to 1,677,690 cases in 1950. In 1950 the volume of eggs officially graded and inspected in Ohio amounted to 26 percent of the eggs marketed from Ohio farms.

In this study, the change in the percentage of eggs officially grading A or higher was used as a measure of change in the quality of eggs.

Because grading standards have not remained the same during the period since the official grading service in Ohio was begun, no comparable year-by-year comparison of quality changes can be made prior to 1943.

The eggs handled by organizations using the official grading service has shown an improvement in quality since 1942. In 1943, 8 organizations, having comparable operating conditions, had 76 percent of their eggs in top grades and in 1947, 85 percent. For all organizations using the grading service during the same period the percentage of eggs in the top grades increased from an average of 55.6 percent to 71.6 percent.

Nearly all producer organizations in Ohio handling eggs use Federal-State grading. In 1949 these organizations handled 13 percent of all eggs marketed from Ohio farms.



Six producer organizations, accounting for about 52 percent of the eggs officially consumer-graded in 1950, comprise less than one-fourth the number of those using the Federal-State grading service in Ohio. These organizations increased their percentage of consumer graded eggs in top grades from 78.6 percent in 1943 to 86.3 percent in 1947.

Quality of eggs among organizations varies considerably. The weekly percentages of eggs in top grades ranged from a low of 86.4 percent to a high of 94.2 percent for one organization. For another organization the low weekly percentage was 31.3 percent and the high was 91.1 percent.

Quality improvement is not the only benefit resulting from payment to producers according to grade. Producers in Ohio selling eggs to buyers, using the official grading service, increased their egg production more than producers selling elsewhere, produced larger eggs, and received higher prices.

The percentage of eggs cartoned by organizations using the Ohio Federal-State Grading and Inspection Service increased considerably since 1943. The use of official grades aids and encourages the marketing of eggs in cartons.

Egg producers and handlers of eggs generally agree that eggs should be marketed on a graded basis. Among these, however, there is not full agreement that the grading needs to be supervised by the Federal or State officials. Those opposed contend that official supervision is unnecessary and an added expense. Those in favor hold that official grading, if widely adopted, would bring about uniform grades and grading standards in the egg markets and would establish greater confidence in grades among consumers at retail levels.

SOME EFFECTS OF MARKETING EGGS IN OHIO  
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State colleges of agriculture, State departments of agriculture, producer cooperatives, the United States Department of Agriculture, and others have for many years advocated marketing eggs on a graded basis. Prices based on grade are considered fairer both to the producer and the consumer than where neither quality nor size is considered. Payment according to quality encourages the production and marketing of higher quality eggs and results in higher returns to the producer.

Since the standards, specifications, and interpretations vary widely among private grades, it is necessary to compare and to measure quality and quality changes in terms of a uniform and definite set of standards which are widely used and uniformly interpreted. The official standards and grades promulgated by the State departments of agriculture and the United States Department of Agriculture meet these requirements. Ohio is one of the leading States in the use of Federal-State egg grades. Federal-State grades are here referred to as official or Government grades. These are the standards and grades promulgated by the United States Department of Agriculture which also have been adopted by a State as its official grades.

As a Research and Marketing Act study, the Ohio Agricultural Experiment Station and the Farm Credit Administration agreed to make a joint study of the effects of marketing eggs on a graded basis in Ohio. The Ohio Station gathered and analyzed data pertaining mainly to the effects on individual producers of selling on a graded basis. This information was obtained from individual producer records furnished by organizations of which the producers were members and from records of the marketing organizations. 1/ The Farm Credit Administration obtained information from the records of the Ohio Federal-State Egg Grading and Inspection Service to determine the broader effects of marketing eggs on a graded basis over a period of years.

Note: The author expresses his appreciation to Ray C. Wiseman, Supervisor, Ohio Federal-State Grading and Inspection Service on Dairy and Poultry Products, for making available records on the grading and inspection of eggs, for reviewing this report, and being otherwise helpful; and to John J. Scanlan of the Farm Credit Administration for advice and assistance in making the study and preparing this report.

1/ Miller, Dwight P., Gray, Raymond E., Dakan, E. L., Marketing Eggs on a Graded Basis in Ohio. Ohio Agricultural Experiment Station, Wooster. Research Bulletin 693. 27 pp. November 1949.



Since this project was a joint effort of the Ohio Experiment Station and the Farm Credit Administration, close coordination between the two agencies was necessary to prevent duplicating work in gathering and analyzing data and publishing findings. If separate publications were issued, each agency was given the right to draw on the other's findings to point up or round out its own publication.

#### PURPOSE OF STUDY

The principal purpose of the joint study was to determine the effects on production and marketing of paying producers for eggs according to quality as measured by official grades. Secondary purposes were to show the growth in the volume of eggs graded under official grades in a State, a pioneer and leader in the use of official egg grades, and to determine the extent to which egg handlers in Ohio adopted Government grades and continued using them.

Some of the effects anticipated and studied were in relation to changes in the size of flocks, quality of eggs marketed, and prices received by producers as direct results of selling on the basis of official grades and standards. Other effects, relating more to the marketing organizations than to the producers, were with regard to the influence of handling eggs on a graded basis, on operating practices, and on prices to producers.

#### OHIO FEDERAL-STATE EGG GRADING SERVICE

The Federal-State Egg Grading and Inspection Service is a cooperative arrangement between the United States Department of Agriculture and a State or other agency requesting the service for the primary purpose of furnishing producers, processors, and others an impartial egg-grading service based on official United States standards and grades. The agreement sets forth the procedures and methods to be followed in conducting the program. These services are on a voluntary basis and are supported entirely by fees charged the users. They are now being used in all States. The service recognizes the need for a uniform system of quality identification applied on a National basis. Such a system facilitates marketing agricultural products through establishing more accurate price and quality relationships. Certificates issued in conjunction with grading the products give legal support to claims which may result from normal marketing operations.

To obtain this grading service, an association contracts with the State agency for the services of a grader trained to grade eggs according to official standards. This grader supervises the work of all other graders in the plant and is responsible only to the person in charge of the Federal-State Grading Service. This policy assures a maximum uniformity of grades of eggs turned out by the various organizations participating in the service. In Ohio, the Federal-State graders are paid directly by the grading service, although the contracting organizations reimburse the State for their services. The official grader may do other work in



the plant than supervising or checking the work of graders under him. Therefore, his services may not be entirely charged to the official grading service. However, in addition, a percentage of the official grader's wages must be paid to the State for his services and supervision.

Under contract grading, eggs may be classified into consumer grades or wholesale grades. When eggs are classified as consumer grades all eggs are graded for quality and size. When eggs are classified as wholesale grades, only a sample out of each lot is graded on an individual-egg basis. The size of the sample depends on the size of the lot but never exceeds 100 eggs per single case lot.

Organizations employing official graders, under a contract with the Federal-State Grading Service, are not required to grade eggs handled according to official standards. However, eggs so graded cannot carry the official inspection seal even through the grading is supervised by the official grader. In the grading reports of the Ohio Federal-State Grading Service such eggs are reported as "other than government grades" or "graded as private grades."

#### Development

The official grading service was set up in Ohio in 1932. Ohio was among the first of the 12 North Central States to offer a Federal-State egg grading service for egg producers and handlers. The service has been continuous over the years. Only 2 organizations, both cooperatives, availed themselves of the service during the first year and one has used the service continually since then.

Organizations using the grading service are located in all parts of the State. Although only one organization used the service during 1932 when it first was offered, other organizations soon contracted for the service. The number of organizations using the service during any 1 year reached a peak of 31 in 1942 and again in 1947 (figure 1). Since 1947 the number has declined slightly with 26 organizations using the service in 1950. The number of new organizations contracting for the service by years, and the number that discontinued the service also, is shown in figure 1. During the period since the service started, 1932-1950, 72 different organizations participated at one time or another. At the close of 1950 only 26 organizations had contracts for the grading service, showing that during the 19-year period 47 organizations that started using the service discontinued it (figure 2).

The length of time which the 26 organizations participating in the service in 1950 have used it as follows:

<u>Years of participation</u>	<u>Number of organizations</u>
16 - 19	5
11 - 15	4
6 - 10	10
1 - 5	7
Total	26

FIGURE 1  
OHIO FEDERAL-STATE EGG GRADING SERVICE: TOTAL NUMBER OF  
ORGANIZATIONS USING THE SERVICE, FIRST TIME USERS  
AND DISCONTINUED USERS, 1932-50

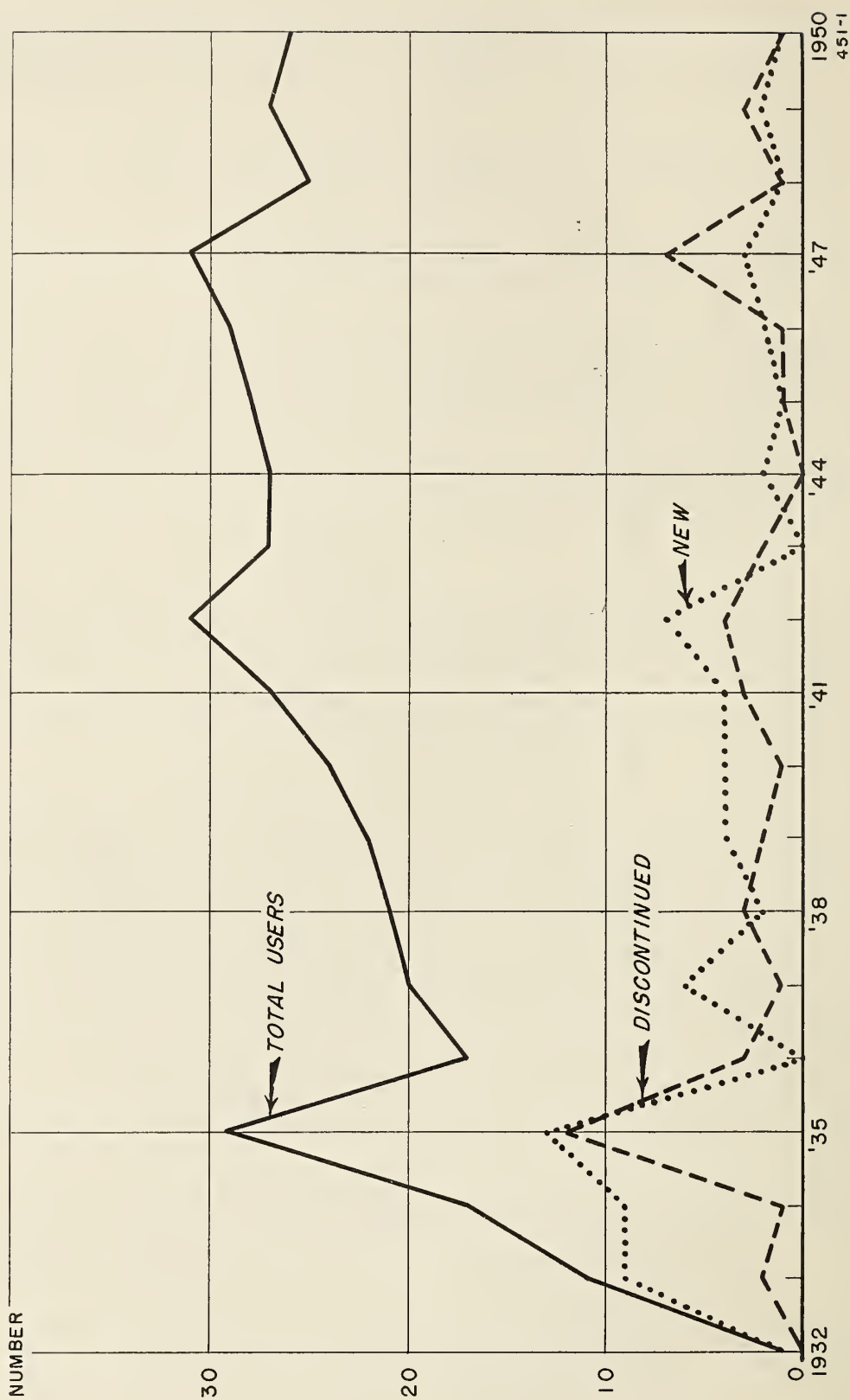
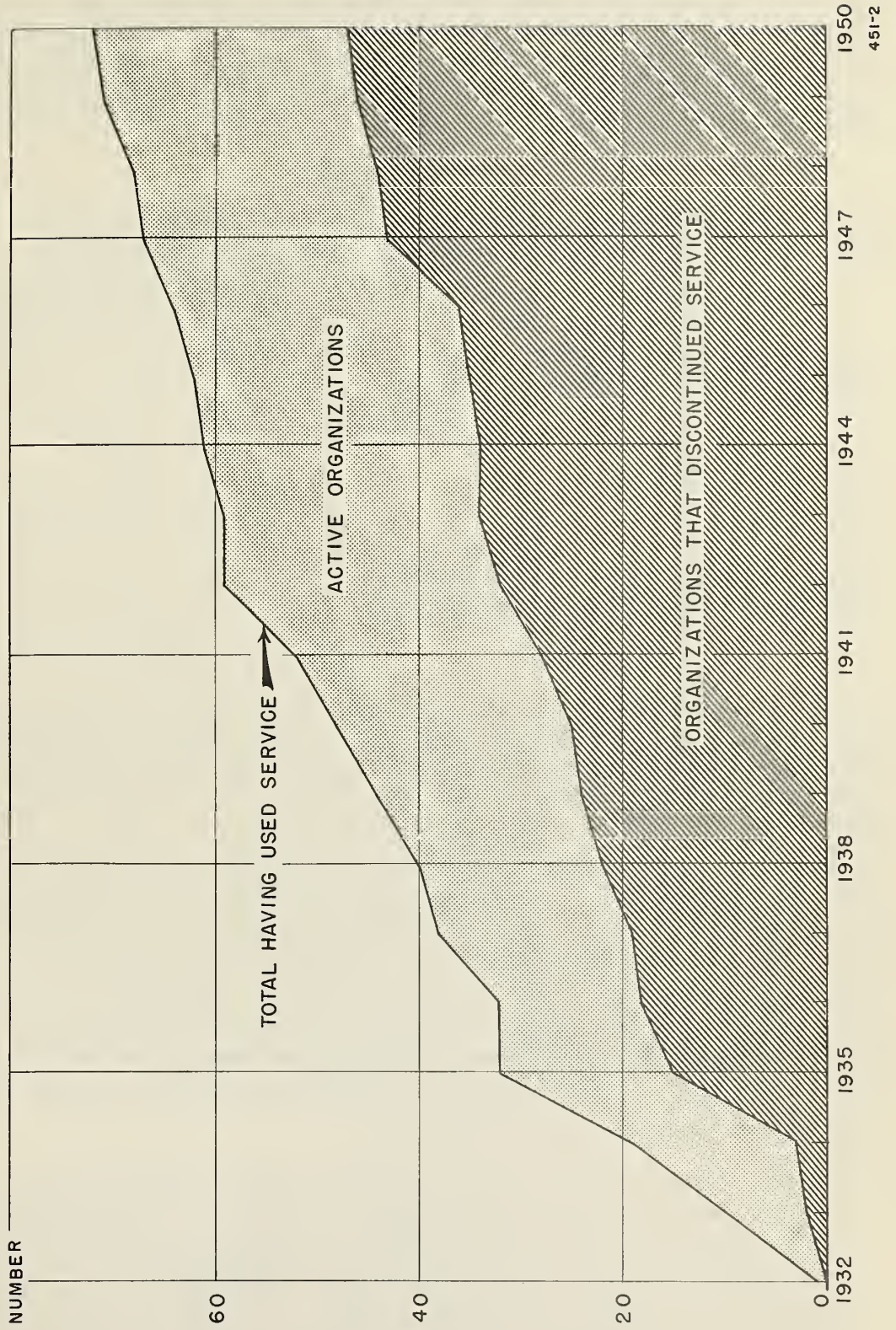




FIGURE 2  
 ORGANIZATIONS USING OHIO FEDERAL-STATE  
 EGG GRADING SERVICE, 1932-50



Nine organizations have used the service for 11 years or more. Six of these nine organizations are producer-owned and started using the grading service at the time they were organized and have used the service continually since. The volume of eggs handled by these six organizations has steadily increased through the years. In 1950 they handled 897,000 cases.

#### Discontinuances

The 47 organizations discontinuing the service during the period did so for a variety of reasons. The reasons given are as follows:

<u>Reasons</u>	<u>Number of organizations</u>
Could not obtain supply of quality eggs due to lack of adequate premium	18
Went out of business or discontinued the handling of eggs	19
Sold business	5
Turned business over to cooperatives or consolidated with other cooperatives	5
Total	47

Of the 47 organizations that discontinued the grading service or went out of business during the period 1932-1950, 12, or nearly 26 percent, did so less than 1 year after starting, and 62 percent in less than 3 years. <sup>2/</sup> This indicates that organizations that take on the Federal-State egg grading service adjust their egg-handling operations within a short time or not at all. Probably the greatest requirement on their part is that of obtaining prices sufficiently high to pay producers to make it profitable for the producers to make the necessary effort to preserve egg quality at the farm. That many first handlers of eggs were unable or unwilling to pay the necessary premiums is indicated by the fact that 18 of the 47 organizations that discontinued the official grading service in Ohio did so mainly because the price incentive given producers did not secure the necessary volume of eggs. Nineteen additional organizations went out of business or discontinued handling eggs because producers did not ship a sufficient volume to permit economical operations. These were largely locals of producer federations that for various reasons failed to obtain the support of the members.

<sup>2/</sup> This action on the part of egg handlers closely parallels that of individual producers marketing eggs on a graded basis as found by the Ohio Agricultural Experiment Station. A study of 1,643 producers marketing eggs on a graded basis showed that approximately 39 percent of them changed their market outlet or quit selling eggs during the first year after beginning the sale of eggs on a graded basis and nearly 74 percent did so during the first 3 years. This Ohio Station study also showed that practically all the improvements made in flock management by the producers during the period of selling on a graded basis stopped when the producers returned to selling on a nongraded basis.



The volume of eggs handled by organizations whose owners sold out to other organizations or those turning their egg business over to cooperatives was not entirely lost to the grading service because some of the absorbing organizations were already using the grading service or contracted for it as soon as the old business was taken over.

### Volume Graded

The volume of eggs graded by the Ohio Federal-State egg grading service, with the exception of 2 years, has steadily increased from 14,000 cases in 1932 to 1,677,690 cases in 1950 (figure 3). Of the 1950 total, 142,705 cases, or 8.5 percent, were graded according to other than official standards. Beginning with 1940, the volumes shown in figure 3 are shown separately for eggs graded on a contract basis and those inspected on a fee basis. <sup>3/</sup> Also, contract gradings are divided to show consumer and wholesale grades separately after 1945. Eggs graded on other than Government standards also are shown separately.

Not only was Ohio among the first of the 12 North Central States to offer a uniform egg-grading service to egg producers and handlers but it has led other States in volume of eggs officially graded and inspected during most of the years since 1932. Ohio has led all the other North Central States in the volume of eggs purchased directly from producers who were paid on the basis of Federal-State grades. Minnesota during the past 5 years, and Iowa during the past 3 years, have forged ahead of Ohio with a larger volume of eggs graded according to Federal-State standards but a smaller percentage of these eggs was purchased from producers on official grades than in Ohio. In 1950 eggs officially graded in Minnesota made up about the same percentage of all eggs sold by producers in that State as in Ohio, 26 percent. In Iowa, however, the percentage was much smaller.

The total volume of eggs officially graded and inspected has come to represent a considerable portion of the total number of eggs marketed by Ohio poultrymen. In 1934, the volume of eggs officially graded and inspected in Ohio amounted to only 2.6 percent of the eggs marketed from Ohio farms. By 1950, this had risen to 26.1 percent including 2.2 percent of eggs not graded to official standards: 18.6 percent represented consumer grades, 4.4 wholesale grades, and .9 percent inspections on a fee basis (figure 4). <sup>4/</sup> A small portion, about 3 percent in 1950, of the graded volumes comes from outside the State.

- <sup>3/</sup> When an organization has not contracted for the official egg grading service and asks to have a lot of eggs officially graded, the work is done on a fee basis, that is a fee is charged for grading the particular lot of eggs. The fee covers the time of the grader and travel expenses to and from the point of inspection.
- <sup>4/</sup> Work of the Ohio Experiment Station showed that in 1947 the volume of eggs sold on a graded basis by producers in the area of one grading station was 27 percent of the eggs sold by all the producers in the area. In one Ohio county more than 53 percent of the total volume of farm sales of eggs were sold on a graded basis in 1949.

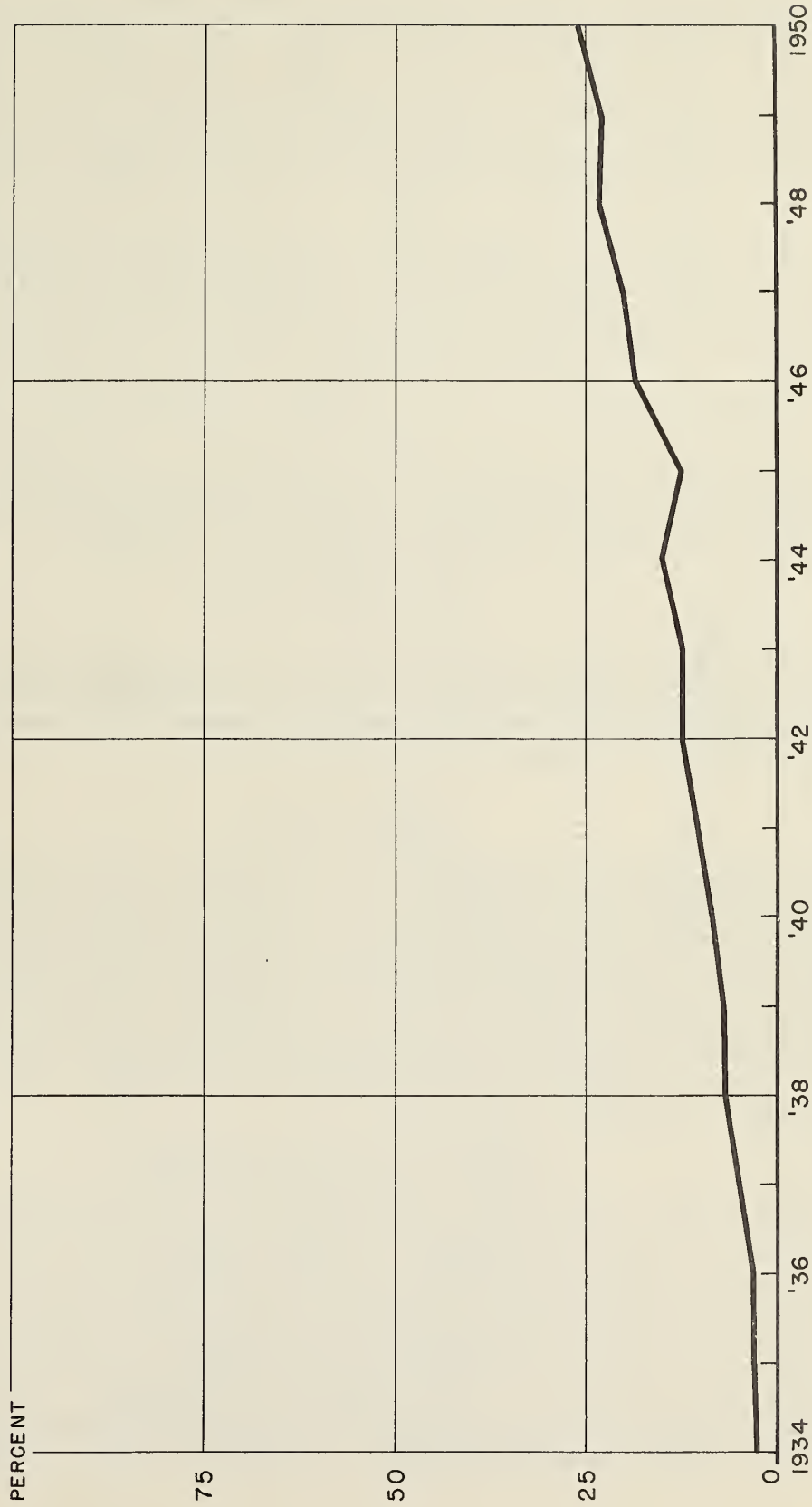
FIGURE 3

# VOLUME OF EGGS GRADED AND INSPECTED IN OHIO BY ORGANIZATIONS USING THE INSPECTING SERVICE, 1932 - 50



FIGURE 4

# PERCENTAGE OF ALL EGGS IN OHIO SOLD FROM FARMS GRADED AND INSPECTED BY OHIO FEDERAL-STATE GRADING AND INSPECTION SERVICE, 1934-50



• INCLUDES A SMALL VOLUME OF EGGS NOT GRADED TO OFFICIAL STANDARDS



In addition to the volume of eggs officially graded and inspected, there are organizations in Ohio that grade additional volumes according to their own grade standards, in an attempt to meet the growing demand on the part of purchasers for eggs of known and dependable quality. Such organizations, however, while selling on a quality basis usually do not pay the producer on this basis. In contrast, many of the organizations using the Federal-State grading service pay the farmer on a quality basis. This encourages the producer to deliver top quality eggs.

In 1932, the only two organizations using the official grading service were producers' associations. On an average since 1940, about half the eggs officially graded in Ohio was handled by producers' organizations (figure 5). During the 10-year period, 1941-50, the producers' organizations handled an average of only 8.8 percent of the Ohio eggs marketed but handled 51 percent of the Government consumer-graded volume.

Of the total volume of eggs officially graded on a wholesale basis in Ohio, 89 percent was handled by 4 producer organizations in 1950. Of the combined volume of officially graded consumer and wholesale eggs in Ohio in 1950, six producer organizations handled 61 percent.

#### QUALITY IMPROVEMENT

A desire on the part of producers to improve egg-marketing was an important incentive to setting up an official egg-grading system in Ohio. It was recognized that a uniform system was needed to help establish a good reputation for Ohio eggs on any quality market.

#### Payment Policy

Some organizations, contracting for the grading service, pay the producers on the basis of how the eggs actually grade out when received into the plant. Others pay the producers on a current receipt basis or use some other classification of their own as a basis of settlement, and grade the eggs according to official standards afterwards. The method of paying producers may have much to do with the success or failure of the grading service for any particular organization using it, particularly if the belief that the quality of eggs marketed by a producer improves when marketed on a graded basis is true.

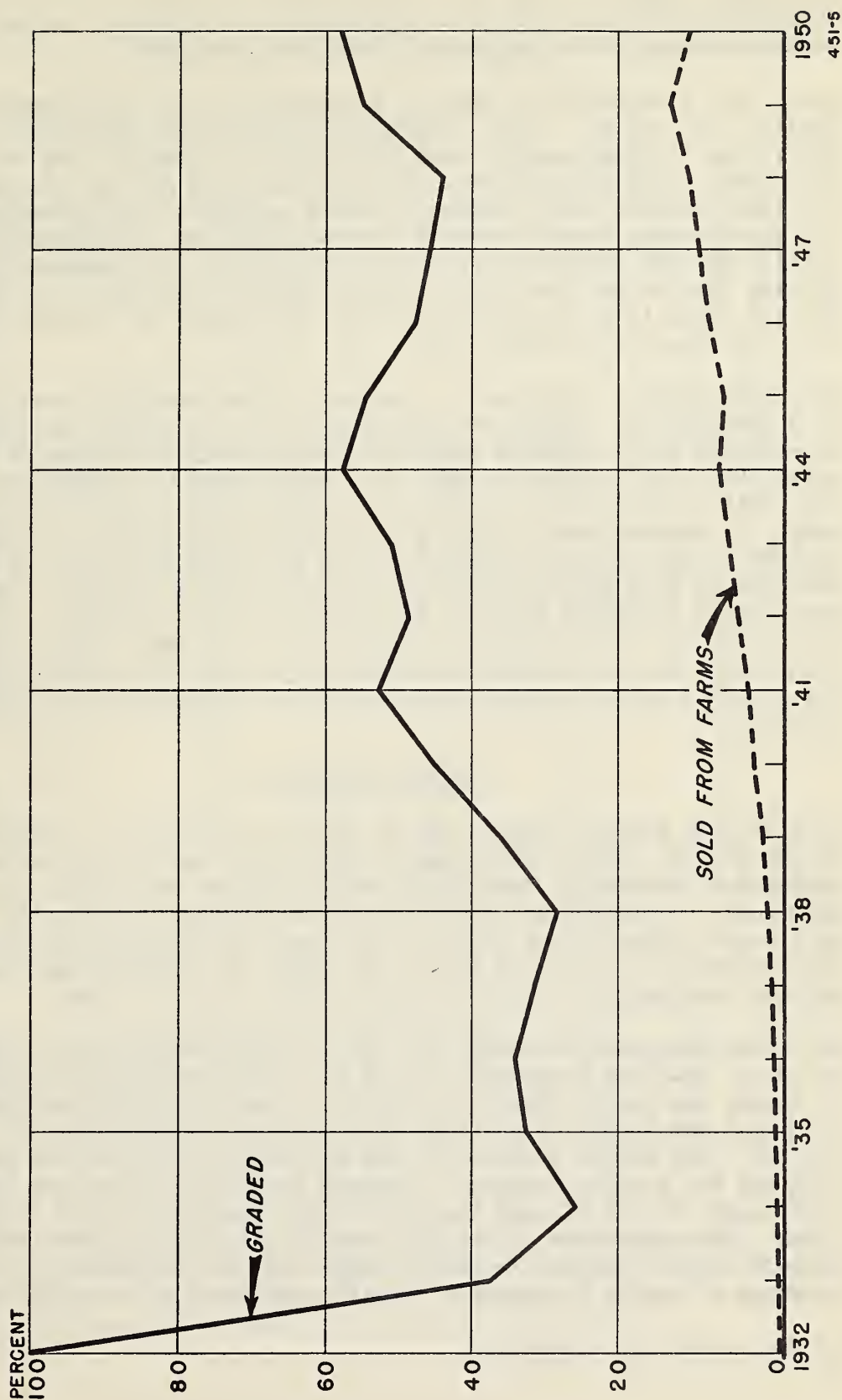
#### Method of Quality Measurement

In this study, the change in the percentage of eggs officially grading A or higher was used as a measure of change in the quality of eggs. Only clean eggs grading A or higher at time of purchase by the first handler are considered as in the top quality class. This measure of quality cannot be used for the entire period the Ohio grading system has been in operation because the official grading standards and nomenclature have not remained the same. Since February 1943, however, there have been no material changes in these respects so a comparable year-by-year comparison can be made from 1943 to date. To measure quality changes in eggs



FIGURE 5

PERCENTAGE OF EGGS SOLD FROM OHIO FARMS AND EGGS GRADED  
BY OHIO FEDERAL-STATE EGG GRADING SERVICE  
HANDLED BY PRODUCER ORGANIZATIONS, 1932-50



officially graded in Ohio with a satisfactory degree of accuracy or reliability, there should be a high degree of uniformity in grading standards among the organizations using the services.

There is a wide variation among organizations in the percentages of eggs grading A or higher. This variation can be affected by whether or not the volume of eggs handled comes directly from farmers, from dealers, or from both. Eggs received from other dealers may have had the low quality eggs taken out and, therefore, would contain a high percentage of top quality eggs when received by the next handler. Variation in egg quality between organizations may be due also to the number of years the grading service has been used because organizations using the service for the first time usually have a lower percentage of top quality eggs the first year or two than later.

This fact also is supported by findings of the Ohio Experiment Station with reference to quality of eggs of producers when eggs are first sold on a graded basis compared with the quality of eggs produced a few years later when they continue to sell on a graded basis. During the first year that 17 producers sold eggs on a graded basis, their eggs averaged nearly 17 percent fewer AA and A grade eggs than the average of all eggs handled by the grading station to which they were selling. During the second year this difference dropped to less than 8 percent. The percentage of eggs in grades AA and A for the 17 producers averaged 59.2 percent in August 1946, 78.8 percent in August 1947, and 84.5 percent in August 1948. This was an increase of nearly 20 percent during the first year and nearly 6 percent during the second year of marketing on a graded basis. 5/

#### Change in Quality

Year-by-year quality changes may be shown by studying the organizations in two groups. First, all organizations using the grading service regardless of methods of operation, length of time the grading service has been used, or continuity of the use of the grading service, and second, only those organizations receiving all eggs directly from producers, paying producers on a quality basis, and using the Federal-State grading service continuously during the period since 1942 or longer.

The first group would include all the 26 organizations using the service in 1950. Only six organizations had used the grading service continuously during the period 1943-50 or longer. However, 8 organizations met the requirements mentioned above of the second group during the period 1943-48. The volume of eggs handled by these 8 organizations was analyzed for quality changes. As shown in table 1, there has been an improvement in the average quality of eggs handled by these 8 organizations. The percentage in the top grades officially consumer graded increased from 76 percent in 1943 to approximately 85 percent in 1947 - an increase of nearly 9 percent. For all organizations using the grading

5/ For source see footnote 1.

service during the same period the percentage of eggs in the top grades increased from an average of 55.6 percent in 1943 to 71.6 percent in 1947 - an increase of 16 percent. However, this percentage for all organizations dropped to 65.9 percent in 1948 but increased to 71.2 percent in 1949 and 74.5 percent in 1950.

Table 1. - Volume of officially consumer-graded eggs handled by 8 Ohio organizations, percentage that their volume is of total volume officially graded, percentage of volume in top grades, and percentage of all officially graded eggs in Ohio in top grades

Year	8 organizations					Percentage of all eggs officially graded in Ohio in top grades
	Volume consumer graded	Percentage of State volume consumer graded	Range and average percentage in top grades <u>1/</u>			
	<u>Cases</u>	<u>Percent</u>	Low	High	Average	<u>Percent</u>
1943..	405,094	54.3	40.6	81.2	76.4	55.6
1944..	514,583	61.1	75.1	93.4	82.1	64.3
1945..	454,460	60.2	67.1	94.2	85.7	67.9
1946..	459,185	46.8	54.8	89.7	85.3	66.9
1947..	476,549	44.6	64.5	90.9	85.2	71.6
1948..	518,533	43.5	65.9	88.8	85.2	65.9
1949..	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	71.2
1950..	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	74.5

Source: Records of the Federal-State Grading and Inspection Service in Ohio.

1/ "A" and "AA" grades - all sizes.

2/ Data not available.

The range in the percentages of top grade eggs among the 8 organizations narrowed during this period. In 1943 the range was 40.6 percent - from a low of 40.6 percent to a high of 81.2 percent. In 1948 the range narrowed to 22.9 percent.

In 1943 the 8 associations handled over 54 percent of the total volume of eggs officially consumer graded in Ohio. This increased to 61 percent in 1944, declined slightly to nearly 60 percent in 1945, and in 1948 had dropped to less than 44 percent. The fact that the volume of eggs handled by these associations has decreased in relation to the total volume officially graded is due almost entirely to expansion in the use made of the Federal-State grading service by other organizations.



### Differences by Type of Organization

The 8 organizations compared are made up of two types. Both types pay producers for their eggs on the basis of grade, but Type I 6/ is different in that it defers payment until after the selling prices have been determined and also does more work directly with the patrons on problems affecting quality (table 2). Type II 7/ pays the producer for eggs on the basis of currently quoted prices for each grade.

Table 2. - Volume of officially consumer-graded eggs handled by two types of Ohio organizations, percentage in top grades, and the percentages their volume is of all Ohio eggs officially consumer graded, by years, 1943-50 1/

Year	Volume		Percent in top grades		Percentage of total Ohio volume officially graded	
	Type I	Type II	Type I	Type II	Type I organizations	Type II organizations
	<u>Cases</u>		<u>Percent</u>			
1943	376,613	28,481	78.6	48.3	50.5	3.8
1944	483,635	30,948	82.2	80.8	57.4	3.7
1945	418,134	36,326	87.2	68.5	55.4	4.8
1946	436,146	17,163	85.8	61.2	45.1	1.8
1947	458,077	18,314	86.3	71.6	42.7	1.7
1948	501,531	18,002	85.6	73.7	42.0	1.5
1949	578,943	<u>2/</u>	83.0	<u>2/</u>	51.3	<u>2/</u>
1950	643,813	<u>2/</u>	82.6	<u>2/</u>	52.4	<u>2/</u>

1/ Type I organizations are 6 producer organizations. Type II are 2 nonproducer organizations.

2/ No longer using grading service or not grading according to official standards.

Type I organizations had a considerably higher percentage of eggs in the top grades than did those in Type II. All the Type I organizations had used the official grading service for a longer period of time prior to 1943 than any of Type II. Improvement in quality was made by both types during the period 1943-48 but the high quality of the eggs handled by Type I, in particular, indicates what can be done to improve the quality of eggs marketed under a careful and continuous program of officially supervised grading, paying producers for quality, and extending a service to producers that will help them maintain quality.

6/ Six producer organizations.

7/ Two nonproducer organizations.



The comparisons shown in table 2 could not be continued after 1948 because one of the Type II organizations discontinued using the Federal-State grading service in 1948 and the other discontinued it during 1949. This left only the Type I organizations with a continuous record of grading through the 8-year period, 1943-1950. Table 2 has been extended to show data for the Type I organizations through 1950. The volume handled by them has continued to increase as has the percentage of the total volume of eggs officially consumer-graded in Ohio since 1948. The downward trend in the relationship of Ohio eggs graded to eggs graded by the Type I organizations was reversed after 1948. These six organizations comprise less than one-fourth the number of those using the Federal-State grading service in Ohio but handled approximately one-half of the eggs officially consumer-graded in the State during the 8-year period, 1943-50. The volume of eggs handled by the two organizations of Type II was much smaller than that of the six organizations of Type I during the 6-year period, 1943-48 (table 2).

Type I organizations are important to Ohio producers in marketing eggs and are leaders in the Ohio Federal-State egg grading program. In 1932, and for a few years afterwards, producers' organizations handled less than 1 percent of all eggs marketed from Ohio farms. This percentage gradually increased until by 1949 it was more than 13 percent (figure 5). A small part of this volume was not graded under Federal-State supervision.

The percentage of eggs of the Type I organizations in the two top consumer grades has decreased some since 1945, particularly in 1949 and 1950, but was still well above the 1943 level and slightly above the 1944 level (figure 6). One partial explanation is that the spread between the price of high quality and inferior quality eggs narrows during periods of price support. This discourages producers from taking care of their eggs and egg quality drops as a result.

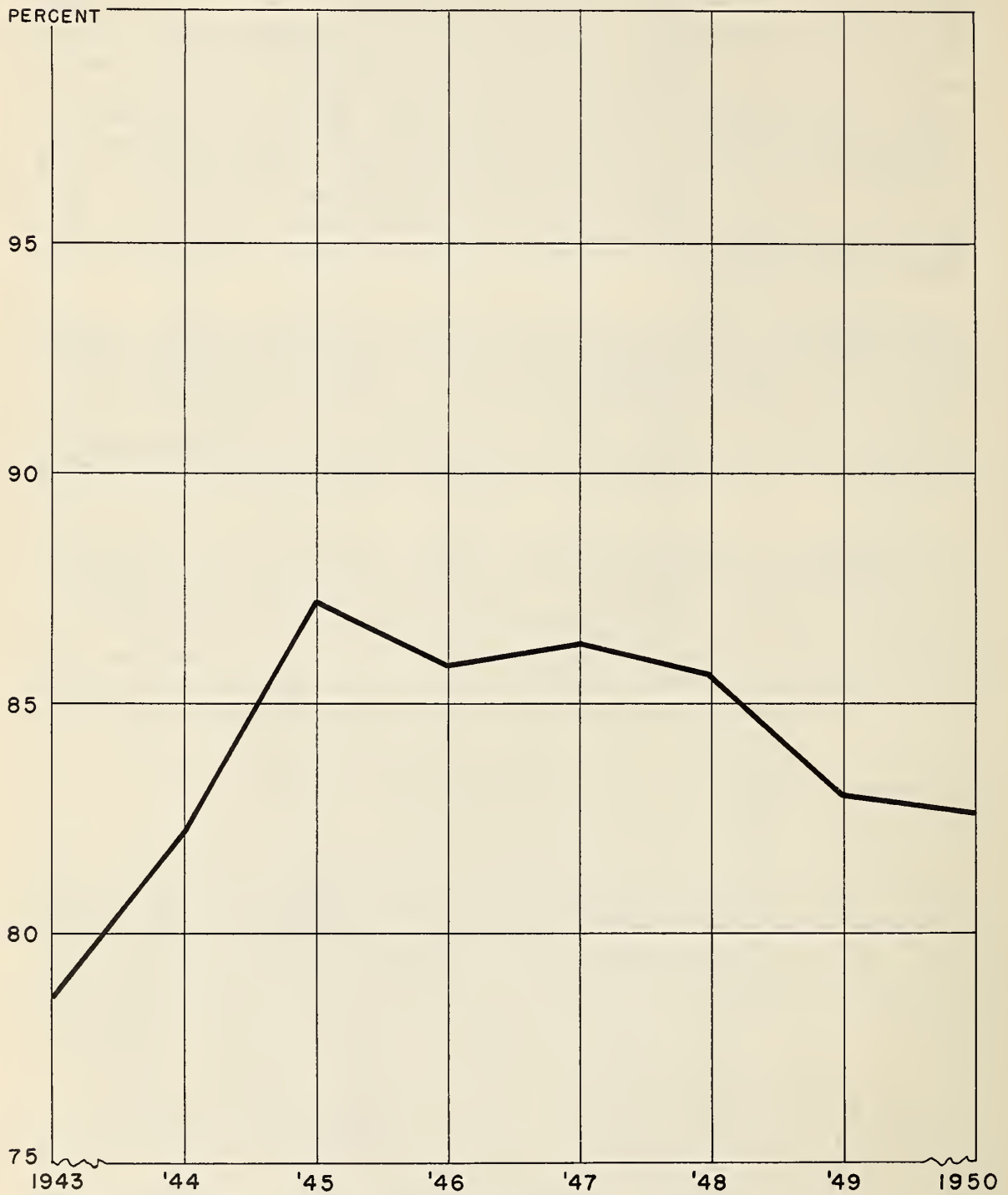
Improvement in quality is more evident when comparisons between high and low organizations are made for 1943 and 1948 as follows:

Organization	Type of organization					
	Type I			Type II		
	Percentage in top grades		Increase, 1943 to 1948	Percentage in top grades		Increase, 1943 to 1948
	1943	1948		1943	1948	
High.....	81.2	88.8	<u>Percent</u> 7.6	56.4	77.0	<u>Percent</u> 20.6
Low.....	67.0	78.7	11.7	40.6	65.9	25.3
Weighted average	78.6	85.6	7.0	48.3	73.7	25.4
Difference.....	14.2	10.1	4.1	15.8	11.1	4.7

Differences in the quality of eggs of the organizations ranking highest and lowest decreased from 1943 to 1948. The decrease was approximately

FIGURE 6

PERCENTAGE OF EGGS IN TOP GRADES\* OF SIX  
TYPE I ORGANIZATIONS IN OHIO, 1943-50



\* OHIO FEDERAL - STATE A AND AA (CONSUMER GRADES)

451-6

the same for both types of organizations - 4.1 percent for Type I and 4.7 percent for Type II. The Type II organizations show a greater improvement in quality from 1943 to 1948 in both the high and low brackets than did those in Type I. This was to be expected since improvement becomes relatively slower as perfection is approached. In 1950 the lowest percentage in the top grades of the 6 Type I organizations was 80.2 percent or an increase of about 13 percent over the low of 67.0 percent in 1943. The same organization was the low organization in 1943 and 1950. This indicates what can be done to improve quality of eggs marketed by farmers under a supervised grading system.

The percentage of eggs graded as checks and losses has undergone no material change during the years the grading service has been available. This means that the increase in the percentage of top quality eggs was made almost entirely by a reduction in the percentages of grades B and C eggs.

#### Variations Among Organizations

The quality of eggs, even among organizations of the same type that have used the official grading service continuously for a number of years, varies considerably. This variation is evident from the standpoint of the general level of quality, seasonal fluctuations in quality, and changes from week to week. The high and low weekly percentages of eggs in the two top grades, the range, and the annual weighted average for each of the 8 organizations using the service continuously during the 5-year period, 1943-47, is shown below for the year 1947:

Organization	Type I						Type II	
	1	2	3	4	5	6	7	8
	<u>Percent</u>							
High.....	93.3	91.1	93.1	94.2	94.8	90.0	91.1	89.8
Low.....	79.9	70.8	73.6	86.4	83.6	75.4	31.3	55.9
Range.....	13.4	20.3	19.5	7.8	11.2	14.6	59.8	33.9
Weighted average.....	87.0	81.6	83.9	90.9	87.8	87.4	64.5	76.6

The variation between high weekly percentages of eggs in top grades runs relatively uniformly between the 8 organizations, varying only 5 percent, from 89.8 to 94.8. However, among the low percentages there was a variation of 55.1 percent - from 31.3 to 86.4 percent. The range of percentages from low to high was from 7.8 to 20.3 percent between the Type I organizations and from 33.9 to 59.8 percent for the Type II organizations.



## OTHER EFFECTS OF OFFICIAL GRADING

While the chief benefit expected from the payment to producers according to egg quality is quality improvement, other benefits may result. The joint study of marketing eggs on the basis of quality in Ohio show several of these other benefits.

### Increased Production

Not only has the quality of eggs handled by organizations using the Ohio Federal-State Egg Grading Service improved but there is evidence that the production of eggs has increased more among producers selling eggs to organizations using the grading service than among the other producers in Ohio. The study made by the Ohio Agricultural Experiment Station showed that the average yearly volume of egg sales for producers in the area served by two grading stations increased nearly 33 percent from 1940 to 1944, compared with an increase of about 28 percent in the total Ohio egg production during the same period.

### Increased Egg Size

Under a grading program, premiums are paid for large eggs as well as for high quality. Therefore, producers selling eggs on a graded basis have an incentive to keep layers that will produce large eggs. The study showed that the eggs sold by 116 producers with 7 to 13 years of experience selling eggs on a graded basis contained an average of 5.8 percent more large and jumbo eggs than the eggs sold by 84 producers with only about 2 years of selling eggs on a graded basis.

The making of such a comparison for the organizations using the Federal-State grading service in Ohio was not possible because sorting eggs by sizes was not uniform.

### Higher Prices

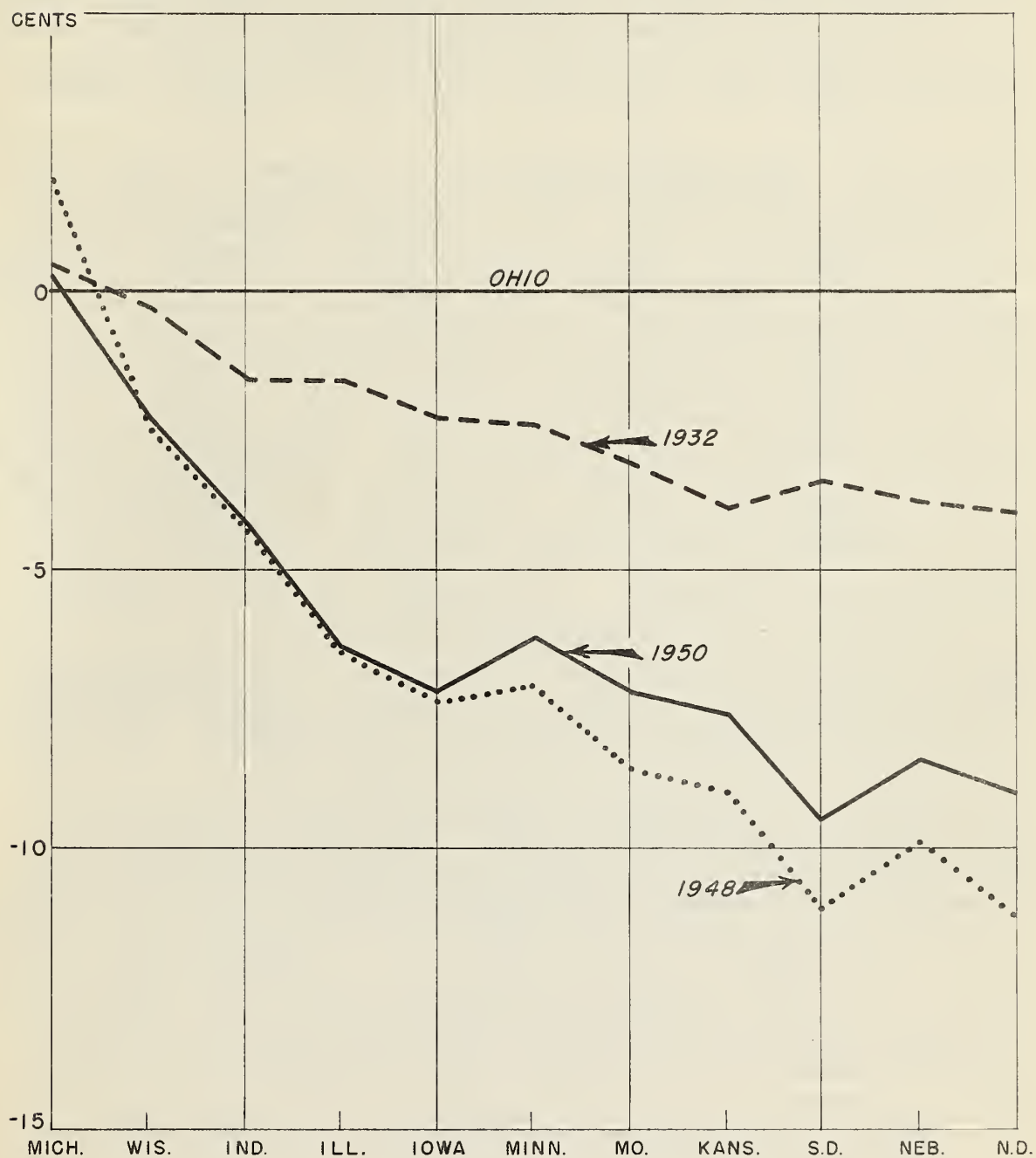
Producers are interested in an egg grading program largely from the standpoint of whether or not returns are greater from selling on a graded basis than on an ungraded basis. There is evidence that producers do obtain higher returns by selling eggs on a graded basis.

In this study no statistical analysis was made of factors affecting the price of eggs in Ohio but it is evident that the quality of eggs marketed in Ohio is related to the average price paid Ohio producers. Ohio egg prices were higher than for any other North Central State in 1932, 1948, and 1950, with the exception of Michigan, which was higher in 1948 and approximately the same in 1932 and 1950. In figure 7, State prices are shown as a deviation from the Ohio price. Price deviations are shown for 1932 to indicate the spread in prices between Ohio and the several States at the time the Federal-State grading program was instituted in Ohio. They are shown for 1948 and 1950 when price relationships were less affected by the Government purchases of dried eggs for price support purposes than for other recent years.



FIGURE 7

DEVIATION OF ANNUAL FARM PRICE<sup>•</sup> PER DOZEN  
OF EGGS FROM THE PRICE IN OHIO, IN STATES  
INDICATED, 1932, 1948 AND 1950



<sup>•</sup>BASED ON PRICES PUBLISHED BY BUREAU OF AGRICULTURAL ECONOMICS

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For the States shown, with the exception of Michigan, the spread was more than double in 1948 and 1950, compared with 1932. In 1932 the average spread between the price in Ohio and the other States was only 2.4 cents compared with 7.8 cents in 1948 and 6.1 cents in 1950. The spread in 1948 and 1950 no doubt would have been even greater for those States where eggs were purchased in volume by the Government, in support of egg prices, had it not been for the support program. For other recent years, when dried eggs were purchased during the entire year, the spread between the Ohio price of eggs and the other North Central States, with the exception of Michigan, was materially less than during years of partial price support.

Among factors other than quality which cause differences in egg prices are location, availability and type of market outlets and agencies, and local demand-supply situation. Ohio is favorably situated in relation to the first two conditions named, but in relation to the third condition it had 85 more eggs per capita of urban population to market in 1950 than did producers in Michigan where the price was about the same as in Ohio. Illinois with 75 fewer eggs per capita of urban population to market than Ohio, had a price 6.5 cents lower in 1948, and 5.9 cents lower in 1950. South Dakota, with an annual average price for eggs 9.5 cents below that of Ohio, in 1950 had the largest production of eggs per capita of urban population of any of the North Central States. Other States in the area, with a grading program not as well developed as in Ohio, had average egg prices much below those of Ohio. However, some of the differences are due to geographical location, surplus production, and lack of favorable market outlets and agencies. Transportation rates account for only a small part of the difference. It is apparent that quality differences are responsible for much of the higher average Ohio price which is not fully accounted for by several other factors. The higher price for Ohio eggs is partly the result of quality improvement. This quality improvement in turn can be traced back, at least in part, to the price incentive accompanying the payment to producers according to quality. Payment on a grade basis is facilitated by the use of official grades.

The finding of a study made by the Bureau of Agricultural Economics, United States Department of Agriculture, shows that producers in the North Central region in 1948, selling eggs graded for size and quality, received 4 cents a dozen more than was received by producers selling ungraded eggs. <sup>8/</sup> Producers in each State in the region reported receiving more for eggs graded for size and quality than for ungraded eggs. In the month of April 1948 this advantage ranged from 1.8 cents per dozen in Kansas to 9.4 cents in Ohio. In August of the same year the graded price advantage ranged from less than half a cent in Michigan to more than 12 cents in Missouri.

<sup>8/</sup> Starkey, W. N., Hester, O. C., Herrmann, L. F., USDA Agr. Info. Bulletin No. 46, Washington, D. C. 1951.

The Bureau of Agricultural Economics in cooperation with the Kansas State Board of Agriculture publishes the price of eggs received by producers by grades each month. The following tabulation shows the amount that the average price received by producers in Kansas for graded eggs is above the price for ungraded eggs by months for 1948, 1949 and 1950:

Average amount prices of graded eggs were above prices of ungraded eggs in Kansas, by months, 1948, 1949, 1950:

Month	1948	1949	1950
	<u>Cents per dozen</u>		
January	2.4	2.0	1.0
February	.9	1.0	1.0
March	1.2	1.0	1.5
April	1.5	1.5	1.0
May	2.6	2.0	1.5
June	2.5	2.5	1.0
July	2.7	3.5	2.0
August	4.1	3.5	2.5
September	4.2	4.0	3.5
October	4.0	2.5	4.0
November	2.5	2.5	3.5
December	2.0	3.0	3.5

#### Changes in Marketing Practices

Retailing eggs in cartons has shown a very rapid growth. Cartoned eggs are usually graded eggs. Therefore, grading and cartoning go hand in hand. Top quality eggs are usually retailed in cartons and different grades are put into differently labeled cartons. These cartons can be made attractive with brand names and the size and quality of eggs given on the container. A uniform system of grading eggs enables handlers to meet more easily the housewife's preference for good and dependable quality. To increase the housewife's confidence that the officially graded eggs are of the quality and size indicated, a Federal-State seal certifying the quality and size of the eggs and the date of grading may be placed on the carton.

During the 6-year period, 1943-48, the organizations in Ohio using the Federal-State egg grading service steadily increased their volume of cartoned eggs from 128,411 thirty-dozen cases (17.2 percent of all Ohio eggs officially graded) in 1943 to 323,852 cases (26.3 percent) in 1948. The volume dropped to 22.6 percent in 1949 but increased to nearly 26 percent in 1950 (table 4).



Table 4. - Volume of eggs cartoned by Ohio organizations using the Federal-State egg grading service and percentage of consumer-graded volume cartoned, 1943-50

Year	Volume cartoned	Percentage of consumer-graded volume cartoned
	<u>Cases</u>	<u>Percent</u>
1943.....	128,411	17.2
1944.....	143,108	17.0
1945.....	189,380	25.1
1946.....	238,471	24.6
1947.....	297,188	27.7
1948.....	323,852	26.3
1949.....	254,758	22.6
1950.....	308,579	25.9

Source of data: Records of the Ohio Federal-State Grading and Inspection Service.

That producer organizations purchase on a graded basis (size and quality) to a greater extent in the North Central States than any other kind of buyer is shown by a survey made by the Bureau of Agricultural Economics in 1948. <sup>9/</sup> While some cooperative associations in the region handled eggs on an ungraded basis, cooperatives led all other types of handlers in the percentage of eggs purchased on the basis of grade. Especially in the case of producer organizations, purchasing on grade is often accompanied by the use of State or Federal grades. All of the larger egg-handling cooperatives in Ohio use Federal-State grades in paying members.

This study indicates that the relatively high prices received by Ohio egg producers may be attributed in part to the quality of eggs marketed. The quality of eggs marketed apparently has been affected by the encouragement given producers through paying according to grade. Producers' organizations have taken the lead in payment according to quality and in the use of Federal-State grades in Ohio. In this study no attempt was made to measure the factors which have resulted in higher producer egg prices in Ohio than for any other North Central State, Michigan excepted, during recent years.

<sup>9/</sup> Footnote 8.



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